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Pavemend - Ceracrete Rapid Repair Products

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EMERGING CONSTRUCTION TECHNOLOGIES

Civil - Composite Materials & Technologies

PAVEMEND - CERACRETE RAPID REPAIR PRODUCTS

THE NEED

Repair of concrete continues to be a major maintenance item in the budget of many agencies. There are many circumstances in which a rapid repair is highly desirable. For example annual appearance each spring of potholes is a major public relations concern. Clearly, there is a need for long-lasting, cost-effective materials for repairing concrete. There is also a need for technologies which are environmentally preferable such as these that use renewable raw materials and are capable of producing products, which meet, and preferably exceed, the service life performance of similar products now made by conventional concrete methods.

THE TECHNOLOGY

Ceracrete Technologies, Inc. (CTI) is a Richmond, Virginia-based small business. CTI focuses on the manufacture of commercial products for construction applications using non-hazardous inorganic recovered raw materials to replace conventional virgin raw materials. Ceracrete technology is a chemical bonding process that uses very high percentages of coal ash, municipal solid waste ash, foundry sand residue, dredge material, flue gas desulferization by-products, etc. to create rapid concrete repair products. The initial Ceracrete rapid concrete repair product, PaveMend, reaches 3670 psi at one hour and 4400 psi at three hours, easily qualifying it as a very rapid pavement repair material. The twenty eight day comprehensive strength levels operate at around 6,000psi. This generally means that field users can mix, pour/place and open the area to traffic quickly without special curing or protection measures. Further, the bond strength of PaveMend is well above the specification requirements for Very Rapid Repair materials. PaveMend exhibits negligible shrinkage and only slight expansion. Ceracrete rapid concrete repair products do not need ultra-high strengths of 10,000 psi or more to get superior bond or freeze-thaw properties. This also means the end-strength is more compatible with the in-place strength of the surrounding repaired concrete. This is particularly important with seasonal expansion and contraction in extreme temperature changes.

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THE BENEFITS

One of the key benefits of the Ceracrete technology is the ability to use large quantities of materials traditionally considered "wastes" as integral ingredients in product composition, thereby directly reducing solid waste landfill requirements. The Ceracrete technology can be used in pipes, drainage systems, bridges, pavements, piers, seawalls, etc. In comparison with conventional concrete CTI offers the following benefits

- Uses renewable rather than virgin materials
- Reduced greenhouse gas emissions
- Low permeability and closed porosity
- Wider temperature range for installing and curing
- Less sensitive to water demand
- Much quicker setting and accessibility times for comparable strengths
- Admixtures (additives) not needed for high performance
- 20-30% lighter with comparable strengths
- User-friendly with no skin irritants
- Use of non-potable water.

STATUS

CTI has demonstrated the capabilities of the PaveMend repair product under a variety of conditions with very good performance results to date. The Civil Engineering Research Foundation's (CERF) Environmental Technology Evaluation Center (EvTEC) has initiated an evaluation of the technology. The draft Evaluation Plan is currently under peer review and testing should begin in late November 2000.

BARRIERS

- Prescriptive building codes
- Lack of standardized testing from a reliable source
- Lack of a network of users

POINTS OF CONTACT

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1. Civil Engineering Research Foundation, Environmental Technology Evaluation Center (EvTEC) http://www.cerf.org/evtec/eval/cera.htm.

REVIEWERS

Peer reviewed as an emerging construction technology

DISCLAIMER

Purdue University does not endorse this technology or represents that the information presented can be relied upon without further investigation.

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